

A Feasibility Study of Shared Storybook Reading in a Sibling Dyad

By

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## **Abstract**

This study investigates a) the whether an older sibling can learn and use interactive story book reading strategies (ISBR) with their younger sibling and b) the benefits and challenges of an older sibling engaged in ISBR with a younger sibling. A single sibling dyad was observed during 8 storybook readings to assess usage of interventions. After a 4-week intervention period, the older sibling increased usage of ISBR strategies. Additionally, book readings were longer in all post-intervention sessions than pre-intervention sessions. Researcher's observations indicated that the older sibling learned information about the book and passed this information to the younger sibling. However, the older sibling struggled to attend to several reading sessions. Results confirm that ISBR training programs can elicit implementation of ISBR strategies in sibling-led interactions.

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## **Introduction**

Since the 1970's, America's academic performance and racial achievement gaps have been recorded by the National Assessment of Education Progress (NAEP) to monitor educational progress when compared to previous generations. Since the first report in 1971, the White-Black achievement gap has decreased 21 points in 9-year old students, 16 points in 13-year old students, and 27 points in 17-year old students. Similar gap trends are shown in the White-Hispanic achievement gap with a decrease of 13 points in 9-year old students, 9 points in 13-year-old students, and 20 points in 17-year-old students (NAEP, 2013). Although the educational trends demonstrate gradual decrease in the past 40 years, present gaps are still prominent and represent the current ethnic/racial disparities in language and literacy development. In the 2012 NAEP long-term trend assessments, racial/ethnic gaps in 9-, 13-, and 17-year-olds showed that White students consistently score 21 or more points higher than Black and Hispanic students in reading and 25 points in math. In 2007, NAEP also compared the reading scores of American Indian/Alaska Native(AI/AN) students to those of other races. AI/AN students scored lower than White and Asian/Pacific Islander students in 4<sup>th</sup> and 8<sup>th</sup> grade but scored equally to Black students in 4<sup>th</sup> grade and Hispanic students in 4<sup>th</sup> and 8<sup>th</sup> grade (Moran et.al, 2008).

## **Role of SES on Educational Achievement Gaps**

Although reasons for the academic achievement gap are continually researched, no single solution has been found to eliminate the gap. There are multiple reasons for the racial/ethnic discrepancies in the nation's education system including but not limited to family income/class and segregation within communities and schools. In relevant research, family income is commonly described by socioeconomic status (SES), a construct that reflects one's access to desired resources such as education, healthcare, money, wants and needs (Oakes and Rossi,

2003). Race is not included in SES; however, racial and ethnic disparities are often influenced by and correlate with SES and the corresponding home environment.

Minority families encountering low-income tend to experience financial strain (Kim, 2010; Miller & Taylor, 2012) characterized by increased psychological stress, stressful situations, and disadvantaged housing (Aneshensel et al, 1991; Emman et al, 2013). According to the 2016 U.S. Census, Black and Hispanic families have consistently lower median incomes when compared to White and Asian families (Fontenot, Kollar, & Semega, 2016). When encountered with stress and a difficult home life, children can often exhibit anger, regression, grief, denial, and/or a fight or flight response (Hill, 1987). Stress resulting from financial strain also increases depression levels in adolescents (Miller & Taylor, 2012) as well as negatively impact classroom success (Parker, Boak, Griffin, Ripple, & Peay, 1999, p. 413) and later academic achievement (Duncan et al, 2007).

Further impacting the achievement gap is the presence of racial segregation, which has decreased from 1970 to 2000 (Jargowsky 1996; Reardon and Bischoff 2011; Watson 2009). Reardon and Bischoff (2011) reported that the achievement gap increased by 40% between high- and low- income families for children born in 2001 when compared to the 1976 trends. Typically, residential communities often consist of families acquiring similar incomes, hence the similar choice in housing. Residential patterns then correlate to school attendance which results in schools attended largely by students from families with similar incomes (e.g. high, middle, low) (Reardon & Bischoff, 2011). Financial and residential segregation within the school system then impacts school quality and resources available due to availability of funds and support (Borman and Dowling, 2010; Coleman et al., 1966; Reardon, 2016). Schools within higher income communities often contained newer and better resources (Reardon, 2011). Additionally,



resourceful schools, such as private schools, tend to house children with high language and literacy skills which is associated with high academic achievement (Chen & Weikart, 2008; Everson & Millsap, 2004)

Of the two reasons mentioned above, a common ground between ethnic/racial discrepancies and academic achievement is SES and the corresponding home environment. Family SES strongly predicts school achievement (Children's Defense Fund, 2004; Lacor & Tissington, 2011; Nikulina, Widom, & Czaja, 2011; Garrett-Peters et al, 2016) and is significantly impacted by factors such as parental education, size of household, and entry-level of employment/occupation (Bornstein & Bradley, 2014) which influence the home environment.

### **Role of SES on Children's Home Environment**

In SES and academic achievement research, many studies correlate parenting characteristics within low SES families to poor academic achievement (Brooks-Gunn & Markman, 2005; Garrett-Peters et. Al, 2016). There are two theories that explain the effects of SES on the home environment. The first model, the parent investment model, states that SES level determines the allocation of economic resources and investments available to children over family needs (Becker & Tomes, 1986; Conger & Donnellan, 2007). SES influences parents' availability and attention to their children, thus limiting educational opportunities and beneficial elements (e.g., toys, books, etc.) in low SES families (Yeung, Linver & Brooks-Gunn, 2002). Investments may also include residential location and living necessities (e.g. food, clothing, medical care, etc.) (Conger & Donnellan, 2007).

In a 2013 longitudinal study (Sohr-Preston et al), 139 3-generation families were evaluated to determine the impact of parental investment on childhood vocabulary and academic achievement. Participants were followed from the time the parents (G1) and then middle/high

school children (G2) had evolved into parents with children of 3-4 years (G3). Assessments of G2 children were conducted annually and their G3 children were later included using vocabulary assessments of each. Results of the study showed 1) G1 parents with more education communicated clearer and more responsively which later was demonstrated in G2 parenting and male education attainment; 2) G2 communication style linked G2 educational attainment and positive G3 vocabulary development; 3) G1 SES predicted G1 and G2 communication styles; and 4) G1 parents with higher SES and educational attainment correlated with high G3 vocabulary development (Sohr-Preston et al, 2013). These researchers hypothesized that parental investment accounts for the association between parental SES and child development.

The family stress model (Elder & Caspi, 1988) states that SES influences parental stress and well-being impacting the home environment and interactions with children. Parental warmth describes the alternating interaction between parent and child as a parent's ability to show affection and respond to a child's needs while demonstrating various emotions (empathy, sympathy, affection, etc) (Durbin, Darling & Steinberg, 1993; Zhou et al., 2002). Parents under economic hardships demonstrate harsher parenting practices (e.g., spanking and yelling) and are less nurturing and responsive than parents experiencing limited stress (Brooks-Gunn & Markman, 2005). This stress later translated to the children, which further exacerbated the development challenges created from a high-stress home environment (Yeung et al., 2002).

In 2013, Emmen and colleagues evaluated 107 Turkish minority parent-child dyads in the Netherlands to determine the effects of socioeconomic status and stress on parenting. They measured family SES (gross annual income and highest educational level), daily hassles (evaluated through the Daily Hassles Questionnaire and ratings by the mothers), acculturation stress (problems experienced by immigrant and refugee mothers and secondary school students),

maternal psychological distress (depression and dissatisfaction), and positive parenting. They found the relationship between SES and positive parenting to be mediated by maternal acculturation stress and maternal psychological distress, however, daily hassles did not mediate this relationship. Additionally, individual relationships between SES and positive parenting, daily hassles and psychological distress were found significant. Ultimately, higher SES correlated with positive parenting, less acculturation stress, and less psychological distress, supporting previously mentioned research that SES impacts the home environment.

Another less researched aspect of the home environment is household chaos which is characterized by noisy, distracting homes, many family and residential changes, and lack of organization and structure (Garrett-Peters et al., 2016; Bronfenbrenner & Evans, 2000). Household chaos is defined as “systems of frenetic activity, lack of structure, unpredictability in everyday activities, and high levels of ambient stimulation” (Bronfenbrenner & Evans, 2000, p. 121). At the time of this study, household chaos had increased due to changing financial and caregiver structures within families which negatively impacted the development of children in poverty (Bronfenbrenner & Morris, 2006; Evans & Wachs, 2010; Presser, 2003). Household chaos can also impact academic achievement by hindering children’s regulatory systems causing difficulty in sustaining attention, focus, and persist through difficult and academic challenges (Brown & Low, 2008; Garrett-Peters et al, 2016). Chaotic households will typically contain negative and authoritative parents that may lack in mentally, emotionally and psychologically supporting their children due to stressors such as irregular work hours and low income (Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 1998; Petrill et al., 2004; Vernon-Feagans et al., 2012; Zvara et al., 2014).

## **Role of SES on Children's Home Language and Literacy Environment**

SES is a strong predictor of language exposure (Hart & Risley, 1995; Ramey & Ramey, 2004; Parker, Boak, Griffin, Ripple, & Peay, 1999; Duncan et al, 2007) Previously mentioned characteristics of SES such as home environment and parent interactions are factors that can influence language exposure. For example, Hart and Risley (1995) investigated how parental interaction in varying SES families influenced language development in children. Over the duration of the study, 42 families were monitored and assessed to determine 1) the amount of language that children hear and 2) the vocabulary size of the children. Results demonstrated that children from high SES families heard over 3,000 words in an hour of interaction; whereas, a child in a low SES family heard only 600 words an hour. This relatively large word difference transforms into a 30-million-word gap by age 3. The major conclusions drawn from the study were that 1) the quantity of speaking with children differs within families, 2) quantity of words spoken is linked to the size of children's vocabulary, and 3) the quantity of words spoken is linked to the quality of parental language used (Hart & Risley, 1995).

To explain why children from the low SES group heard less words compared to those from the high SES group, Hart & Risley (1995) described the schedules of these families. Although the high SES families were involved in many extracurricular activities and events, they made consistent time to speak and read together. In the lower SES families, there was little time dedicated specifically to speaking and interacting with each other. Many times, parents or caregivers would be present but would not give direct attention to the child.

Recent studies demonstrate similar trends regarding SES with language exposure. Hoff (2003) assessed 33 high-SES and 30 mid-SES mother-child dyads and found differences in expressive vocabulary of the 2-year-old children. Mothers were selected for two education

groups to represent SES level: college educated and high school educated. The children's language samples were gathered across 2 points, separated by 10 weeks. Children from the low SES group demonstrated an increase of 10.2-word types per 90 utterances while the high SES group increased by 14.27-word types per 90 utterances. This difference was significant. High SES mothers produced more speech properties (number of utterances, word tokens, mean length of utterances (MLU), word types, topic replies) than Low SES mothers. Additionally, children's vocabulary size at the end of investigation was predicted by the mothers' number of word tokens, number of word types, and MLU.

Fernald, Marchman, & Weisleder (2013) evaluated 48 English-learning infants and discovered significant differences in the vocabulary and language processing skills of 18- to 24-month old children. Participants ranged in SES based on maternal education and Hollingshead Four Factor Index of Socioeconomic Status (HI, Hollingshead, 1975) and divided into Lower SES (n=23) and Higher SES (n=25) groups. Participants' expressive and receptive vocabulary were tested at 18 months and 24 months and there was a significant correlation between SES and vocabulary growth across the 6 months. At 18 months, 12 of 23 children in the Lower SES group had a vocabulary of less than 50 words compared to 8 of 25 in the Higher SES group. By 24 months, Higher SES children produced an average of 450 words while Lower SES produced approximately 300 words. During this period, Higher SES children made significant gains when compared to Lower SES peers. Additionally, Higher SES children demonstrated quicker reaction time in receptive vocabulary tasks with higher levels of accuracy than the Lower SES group. Moreover, the 24-month-old Lower SES group demonstrated similar accuracy and reaction time in receptive vocabulary tasks as the 18-month-old Higher SES group.

In addition to literature on SES and language exposure, SES has also been found to impact literacy outcomes in children. A longitudinal study in China, examined SES effects on early phonological skills, reading and vocabulary (Zhang et al, 2013). In the study, 262 monolingual children from different SES backgrounds were assessed at ages 4 and 5 for vocabulary and phonological predictors and age 9 for reading. The children's SES category was determined by both parent's income and education levels. Childhood SES positively correlated with receptive and expressive vocabulary size at ages 4 and 5 meaning that children from high SES backgrounds had larger vocabulary compared to children from low SES backgrounds. Correlation coefficients between childhood SES and phonological abilities correlations were small at age 4 but significantly increased by age 5, with children from high SES backgrounds having stronger phonological skills. Additionally, early phonological and vocabulary skills could mediate the positive relationship between SES and reading achievement by the end of 3<sup>rd</sup> grade. Ultimately, this study agreed with current findings on the positive correlation between SES to language and reading.

SES influences many aspects of the home environment, specifically those involving parent-child interactions. Low SES families, by definition, have less financial resources which may significantly limit the time available to spend with their children and the number of learning material and tools (e.g., books, toys, etc) in the home. Hart and Risley (1995) and subsequent studies (Hoff, 2003; Marchman, & Weisleder, 2013; Zhang et al, 2013) demonstrate how these limited resources can negatively affect the quantity and quality of linguistic content that children experience, especially when compared to children with access to more resources. In response, educators and scientists were interested in compensatory and preventative strategies to maximize time spent with children in everyday routines. Interactive shared book reading and dialogic

reading are two of these strategies. Introducing interactive shared book reading and/or dialogic reading to a family's routine or modifying current reading interactions with interactive reading strategies can easily promote language and literacy development (Justice & Ezell, 2000; Wasik & Bond 2001; Whitehurst et al. 1999), thus one way to reduce the indirect effects of SES on language, literacy, and academic achievement.

### **Shared Storybook Reading as Strategy to Promote Language and Literacy Development**

There is substantial research supporting interactive shared book reading (ISBR) as an effective way to develop vocabulary development in children (see Wasik, Hindman, and Snell, 2016 for review). ISBR occurs when a person, typically an adult, reads to a child while encouraging book interaction and language growth using interactive strategies (e.g., comments, questions, etc.) (Bus, van Ijzendoorn, and Pellegrini, 1995; Wasik & Bond, 2001). ISBR is an effective language practice because it is beneficial for any child and has been shown to increase children's awareness of print and literacy and lays the foundation for later language and literacy development (Justice & Ezell, 2000; Whitehurst et al. 1994; Whitehurst et al. 1999). Additionally, storybook reading provides insight into parental language and conversation (Kaderavek & Justice, 2002).

The difference between storybook reading and shared storybook reading is the interaction with the child. In a typical storybook reading, the speaker reads the text with limited comments about the pictures or story plot. In this setting, the child is a passive learner, expected to listen and look at the pictures. This type of reading is beneficial in that it allows the child to listen to the adult's language and vocabulary, but limited because the child is not an active reading participant. Shared storybook reading engages the child and focuses less on reading the book,

and more on the plot, print, and pictures. Readers within a shared storybook reading typically use interactive reading strategies to encourage the child to respond and talk about the book.

Many strategies and approaches can be used to successfully target language through shared storybook reading. Dialogic reading (DR) is a strategy that focuses mainly on prompting characterized by the adult member taking a passive role by asking questions, adding information, and encouraging the child to comment and discuss (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Button & Johnson, 1997; Lonigan & Whitehurst, 1998; Valdez-Menchaca & Whitehurst, 1992; Whitehurst & Lonigan, 1998). On the contrary, ISBR is a strategy that focuses on child engagement characterized by the child taking a passive role while the adult reads and encourages interaction (Wasik & Bond, 2001; Trivette & Dunst, 2007). These strategies are separated by the level of child interaction with DR requiring more engagement than ISBR.

Burns, Griffin, & Snow (2000) used two types of dialogic strategies, CROWD and PEER. When using CROWD, the adult will use: C: completion questions, R: recall questions, O: open-ended questions, W: 'Wh' questions, and D: distancing questions that help the child bridge book material to real-life experiences (Burns, Griffin, & Snow, 2000). When using the PEER sequence, the P: Parent/adult initiates exchange, E: evaluates the child's response, E: expands the response, and R: repeats the initial question. Each of these strategies demonstrated significant outcomes and facilitated effective interaction between the book and the child to increase word discussion and book interaction (Blom-Hoffman, O'Neil-Pirozzi, & Cutting, 2006; Morgan & Meier, 2008).

Another strategy, specific commenting, requires the adult to relate the story plot to the child's personal experience (Hockenberger, Goldstein, & Sirianni Hass, 1999). This strategy has



been found to increase the number of utterances and dialog with adults during reading interactions as well as increase language development and MLU (Whitehurst et al., 1988). On the other hand, print referencing strategies, which encourages the child to comment on the book's print specifically, includes: commenting on words and letters, asking questions about words and letters, pointing to words, tracking text, commenting about rhyme, commenting on word endings and talking about letters (Sim, 2012). When compared to baseline scores, Sim (2012) found significant improvements in children's expressive vocabulary, rhyme and concepts about print when using shared reading with dialogic and print-referencing strategies. Other dialogic strategies include: discussing the book title, and having fun (Sim, 2012).

Several studies illustrate the effects of ISBR on at-risk children in low SES families. Justice and colleagues (2005) assessed 58 children from urban elementary schools and used 10 books, selected with Hargrave and Senechal's (2000) criteria, with 60 unfamiliar words to determine words learned. Conducted across three stages (pre-intervention, intervention, post-intervention), the study resulted in several findings. First, non-elaborated exposure (words read in the book but not identified) increased word-learning in the subjects. Second, elaborated exposure (words explicitly identified by an adult) resulted in significantly higher gains in the treatment group between pre- and post-intervention, suggesting elaboration and exposure are important when reading. Third, when exposed to elaborated words, children with low scores prior to intervention demonstrated a significantly higher vocabulary increase when compared to children with high scores.

Neuman and Kaefer (2018) assessed shared book interventions on school-aged, low SES children. SES was determined by free and reduced lunch, in which 71-100% of participants qualified. Intervention was adapted from World of Wow (WOW; Neuman, 2016) which targeted

science in shared storybook reading, and consisted of 10 topic-related text sets (includes teacher lesson plan, highlighted target words, and target concepts) per grade along with 5 read-aloud books per set. Teachers used this system to progress from explicit instruction of topic during reading to eventually allow the children to take the lead by expanding and discussing information about the topic. Children used both content-specific and familiar words during this time. At the end of the study, pre-K and kindergarten children demonstrated growth in science related vocabulary and concepts.

Gettenger & Stoiber (2018) used letters and sounds (code-focused), and words and concepts (meaning) in shared book reading to increase vocabulary and print awareness in low SES children. Forty-three children participated. Researchers used four conditions: code focused (CF), meaning focused (MF), code and meaning focused (CF-MF), and control (CON). Twelve books were used with 2 target words in each (24 total). A pre-intervention, post-intervention design was used in data collection. All subjects experienced gains in letter knowledge following the intervention; children in the CF condition identified the most letters. All participants also demonstrated gains in rhyme and sound awareness, but children in the CF condition demonstrated the most gains in rhyme and sound awareness. Additionally, children in MF and CF-MF conditions had higher post-intervention picture definition scores compared to CF and CON. Overall results suggested that shared book reading, with the use of meaning and letter strategies, positively influences vocabulary and print awareness in at-risk children.

In addition to an increase in receptive abilities, shared storybook reading with interactive reading strategies increases children's oral language skills, and exposes children to conversations that are more challenging and linguistically complex than those found in typical interactions of young children (Scarborough and Dobrich, 1994; Kamhi & Catts, 2012). With these interactions,

children are exposed to unfamiliar and content-specific vocabulary that would not occur in the day-to-day routine. This increases the quality of language and improves language access, which significantly benefits the child's learning opportunities.

Due to the effectiveness of shared storybook reading as an informal practice in family homes, shared storybook reading can also be effective as a structured intervention strategy to target speech and language deficits. Recent studies found shared book reading to increase reading engagement (e.g. responding to adult questions, initiating questions/comments, and looking at materials/reader) in children with autism (Fleury & Hugh, 2018; Golloher, 2017).

Storkel et al. (2017) researched intensive shared book reading with children with specific language impairments (SLI), who require more than twice the new word exposures than typically developing children (Gray, 2003; Rice et al, 1994). In the Storkel et al. (2017) study, 12, 24, 36, and 48 exposures of words were tested to promote word learning in 27 children with SLI (Storkel et al, 2017). Interventions included 10 books with previously selected verbs and adjectives; 5 books were assigned to both the control and intervention group, allowing each child 30 new words. Book readings lasted 15-20 minutes allotting time for *pre-book reading*, which prepped the child with exposures to the vocabulary and corresponding synonyms; *book reading*, where interactive reading of the book took place; and *post-book reading*, which revisited the vocabulary and corresponding synonyms. In post-intervention results, children exhibited the highest response to 36 exposures of words. Similarly, children with 36-word exposures learned the highest number of words (5). Eighty-six percent of the children with 36 exposures positively responded to treatment. These results are significant due to the difficulty children with SLI demonstrate in learning new words.

Shared book reading is beneficial to children in many ways, both in language and other domains. However, facilitating shared reading strategies without prior experience or training can be a difficult task for most parents. Adult and parent training programs are effective ways to teach adults and parents how to implement shared story book reading techniques within their natural settings. These programs also train the public and advance current research in practices that develop the most effective language interventions with at-risk children.

### **Parent/Adult-Focused Interactive Shared Book Reading Training Programs**

Teacher and parent training programs form a portion of the research supporting the effectiveness of shared storybook reading through adult training programs. Wasik & Bond (2001) observed interactions between 127 low SES 4-year-olds and their teachers during an intervention consisting of 4 weeks of modeling the intervention, followed by 11 weeks of teacher-facilitated book reading. During the readings, teachers 1) defined vocabulary and prompted the use of vocabulary, 2) asked open-ended questions, and 3) provided opportunities for the children to talk and be heard. Teachers were assessed on usage of target vocabulary during classroom interactions. Teachers in the experimental group significantly increased vocabulary usage compared to teachers in the control group. Each of the children were assessed using the Peabody Picture Vocabulary Test-III (PPVT-III; Dunn & Dunn, 1997) a receptive language measure using targeted vocabulary, and an expressive test of the same vocabulary, prior to intervention. The children who experienced the shared story book reading intervention demonstrated significant gains in expressive and receptive vocabulary, as measured by the PPVT and EVT and classroom observations. Practices such as asking and answering questions and prop usage were also found to increase participation in the book reading, thus furthering the learning opportunities and vocabulary exposure.

It is hypothesized that routine book interactions in the home may significantly decrease the indirect impact of SES on children's language and literacy. Evidence, such as those mentioned above, shows that short-term reading programs have positive changes in storybook reading and mediate the impacts of SES. It is also hypothesized that long-term reading programs will result in long-term effects that mediate the relationship between SES and child language. Additionally, adult training interventions provide family members with the tools and strategies to intervene with their children. Parents, trained on interactive reading, are ideal facilitators of shared book reading because of their significant influence on a child's language and their parent-child interactions normally occur in the child's natural setting.

Sim et al. (2013) compared dialogic reading and dialogic reading with print referencing with parents of 80 Australian preparatory year children (aged 5 by June 30<sup>th</sup> of prep school year). Parents were trained for one hour on the use of their assigned strategies. Training consisted of one video per strategy and take-home copies of demonstrated strategies. Parents were asked to conduct reading intervention three times each week for eight weeks. Researchers used implementation fidelity measures (e.g., home recordings of reading interactions, weekly phone calls from researcher, parent-completed reading logs) to ensure the parents learned to reliably implement the shared reading interventions. Children underwent initial assessments and then participated in intervention and post-measures, including the PPVT-IV (Dunn & Dunn, 1998), The Hundred Pictures Naming Test (HPNT; Fischer & Glenister, 1992), The Expressive One-Word Picture Vocabulary Test (EOWPVT; Gardner, 1990), the Phonological Abilities Test (PAT; Muter, Hulme, & Snowling, 1997), and the Concepts about Print (CAP; Clay, 2002). Prior to intervention, the children demonstrated similar competence on pre-intervention measures. Following intervention, the dialogic reading (DR) and dialogic reading with print referencing

(DR+PR) groups showed improvement on HPNT, PAT-Rhyme, and CAP scores when compared to the control group. Significant vocabulary differences using the PPVT, PAT-word completion, and PAT-Alphabet Knowledge were not found. There were no significant differences between the DR group and DR + PR group on post intervention scores. However, the DR and DR + PR groups maintained vocabulary gains when assessed three months later. Ultimately, this intervention resulted in positive implications supporting the use of parents for shared book reading implementation.

Thirty-Six Australian children with language delays and their parents engaged in a parent-training program to determine the effects of shared reading with this population (Colmar, 2014). Children were aged 4;3 to 5;7 and attended special preschool programs for low-income families. During the study, children were assigned to either Experimental Language Difficulties (ELD), Control Language Difficulties (CLD) or Control Language Normal (CLN). Initial language and vocabulary assessments were conducted prior to intervention. Parent training prior to intervention consisted of a single one-hour session explaining the study's four simple components that were easy to follow and understand: 1) pausing to give the child time to speak, 2) asking open ended questions, 3) using picture books as a gateway for language teaching and learning, and 4) using pausing in everyday interactions. Researchers provided parents with short demonstrations, picture books, written guidelines, and a personal copy of explained strategies on CD. Parents were asked to complete their storybook reading activities 5-15 minutes every day for four months and to use strategies in daily activities.

Prior to and following the intervention, the children's receptive and expressive language skills were tested using the PPVT and the Test of Early Language Development (TELD3, Hresko et al., 1999, 3rd edition). Post-intervention, ELD children scored significantly higher on

language measures compared to the CLD and CLN children; CLN and CLD showed no significant changes in pre- and post-scores. Additionally, effect sizes for the ELD group were 1.50 for expressive language and 1.67 for receptive language and 1.73 for the overall language quotient on the TELD3, which is considered large to very large. PPVT3 effect sizes was .80 for receptive language, lower than TELD-3 receptive language but still a large effect size. Post-intervention parent interviews showed consistent implementation of strategies by parents while also showing positive perceptions about the intervention process, interactions between parent and child, and child vocabulary progress.

Parent-implemented print referencing strategies also resulted in increased literacy skills with 28 families of 4-year-olds (Justice & Ezell, 2000). Justice and Ezell's intervention included an orientation for both experimental and control groups consisting of recording a parent-child reading interaction and a brief explanation of the reading program. The 4-week intervention phase followed with sessions occurring in the family's home. For the experimental group, verbal (comments, questions, and requests) and nonverbal (tracking and pointing to print) references strategies were introduced during the first 15 minutes of the first session. Parents viewed an instructional video followed by 2 additional off-video demonstrations of each. A practice session was conducted with the child, and then parents gave verbal feedback. At the end of the training, parents were instructed to continue the learned strategies at least 3 times in their home reading interactions. Compliance was monitored by a weekly phone call. Control group parents did not receive additional training and were instructed to continue reading at home in their normal manner. Parents from both groups received 8 children books (2 books read 4 times a week, 16 total) at the end of the first session. Parents in the experimental group increased their use of print referencing strategies while parents in the control group showed little increase.

Children in the experimental group also outperformed the control group in early literacy scores, with only one test (Alphabet Knowledge) having similar scores for both groups. There were no significant differences between groups on the parental questionnaire. Ultimately, parental training of print-referencing strategies resulted in significant increase in the usage of strategies at home. Additionally, parental implementation resulted in significant gains in children's print concepts, word concepts, and word segmentation abilities. Finally, parents who used these strategies reported high satisfaction of the training on the progress of their child's literacy skills.

As demonstrated in the studies above, successful implementation of parent-directed shared book reading increases child literacy and language skills. This finding is especially important for families in low SES households, where children are at-risk for language and literacy deficits. One area of concern related to low SES families is that implementation of parent-directed intervention is dependent on the parent's schedule and availability. In today's society, there is a rising demand for around-the-clock services, thus increasing nonstandard schedules (evenings, nights, and weekends) (Presser, 2014; Li et al., 2014). Irregular work schedules are an appealing option for low SES families due to parent's desire to increase time spent with children, increase household income, and/or a lack of childcare (Barnett & Gareis, 2007; Garey, 1999; Han, 2004; Hattery, 2001; Presser, 2003; Wight, Raley, & Bianchi, 2008). Unfortunately, nonstandard schedules are associated with sleep deprivation and mental stress, which can lower quality of parenting, time spent with children, and the home environment (Li et al., 2014). Additionally, limited supervision and involvement with parents is characterized by non-interactive past times (e.g. television) and is associated with underdeveloped vocabulary and phonemic awareness skills.



With the possibility of limited schedules of parents in low SES families, it is important to consider other facilitators who may have the same success with shared book reading programs. According to the 2017 U. S. Census, 78.9% of children in the United States have one or more sibling. In homes of families who have more than one child, it is likely that children interact more with each other than with their parents, and sometimes older children serve as caregivers while parents are working or addressing other responsibilities.

### **Sibling Interactions and Language/Vocabulary Development**

Knoester & Plikuhn (2016) evaluated the impact of reading in sibling relationships on younger siblings' academic achievement. Interview transcripts of 26 adults with advanced degrees were analyzed to investigate childhood reading environments. Each adult reported to have at least one older sibling and grew up with both parents lacking advanced degrees. Researchers found that 96% (25/26) of participants reported that their older sibling modeled reading for them and had out-of-school reading interests. Seventy-seven percent (20/26) reported that their older sibling influenced their reading habits outside of modeling reading (e.g., sharing reading material, reading aloud, direct teaching of reading strategies and commenting on reading, and talking about reading). However, only 12% (3/26) reported their older sibling read aloud to them and 12% (3/26) reported that their older sibling taught them how to read. Training older siblings to engage in shared story book reading and promote early literacy may be an area to explore.

This data signifies the influence older siblings have on their younger sibling's reading, as 92% of children in this study considered themselves avid readers. Although the percentage of individuals read to by their older siblings is low, the influence older siblings have on younger

sibling's reading is evident. This poses the question of whether sibling training programs with ISBR and/or DR strategies could be used to increase interactive reading in sibling, thus having the same effects on language and literacy development as parent-child interactions.

Although research investigating sibling interactions and language development is limited, there are several studies that discuss the impact of siblings on educational development. When observing 16 families with at least 2 children, Gregory (2001) found boys read to their siblings more often than girls making them more reliable facilitators of language/literacy interactions. Each sibling dyad were observed to play different types of games, read a variety of books, sing songs and rhymes, and attend clubs and competitions.

Both younger and older siblings can initiate interactions that are educational for both siblings (Sokal et al, 2008). In addition, siblings have been observed to have synergy that is lacking in parent-child interactions (Gregory, 2001). This synergy describes the process of internalization of information during teaching and play interactions. In other words, children teach their siblings a skill while expanding upon that skill themselves. Researchers seek to observe sibling interactions and describe the children's ability to interact and teach each other using play and storybook reading. However, there is limited research evaluating how siblings' interactions are manipulated to increase interactions and target language and literacy development.

### **Purpose of Study**

SES is influential in many factors impacting child development, including parental involvement, overall home environment, and language and literacy environment in the home. Low SES families face challenges to giving the best educational foundation compared to more

affluent families such as limited resources, hectic work schedules, and less time with their children. Parent-child interaction strategies such as ISBR can be implemented to increase the quantity and quality of these interactions but some parents, especially those from low SES families, may not have the time to invest. However, older siblings may be a reliable alternative facilitator of ISBR strategies. The purposes of this study are:

1) to investigate whether an older sibling could learn and use ISBR strategies with their younger sibling.

2) to identify and describe the benefits and challenges of an older sibling engaged in ISBR with a younger sibling.

It was hypothesized that the older sibling would be a reliable facilitator, and with training, increase their use of target ISBR strategies during independent shared story book readings with the younger sibling.

## **Methods**

### **Participants**

The study design required participants be a sibling dyad. Inclusionary criteria for participants required at least a 4-year age gap with the older sibling to be enrolled in elementary or middle school and the younger sibling to be 5 years or younger. Participants of this study were required to be native English speakers and low SES as defined by their eligibility for free or reduced lunch. Researchers determined SES by free/reduced lunch because it was a predictor that could be easily identified and representative of limited financial resources. Low SES siblings were targeted to identify other potential ways low SES families could provide more linguistic and literacy experiences to their children. The final criterion was that the older sibling was typically developing and without a language disorder/deficit. The older sibling needed to be able to read a variety of different types of books while learning and implementing interactive shared book reading (ISBR) strategies in a short period of time. Although individuals who possess a language disorder may be able to implement ISBR strategies, researchers believed that typically developing children would have the highest rate of success.

Participants were recruited using flyers at several preschool locations in the Lawrence and Topeka area. Flyers were distributed to classroom teachers at the Jardine Elementary, and the Little Nations Academic Center at Haskell Indian Nations University as well as posted within the Schiefelbusch Speech-Hearing Clinic at the University of Kansas. A student at the University of Kansas saw the flyer and contacted the researcher because her younger siblings matched the inclusionary criteria. After a brief entry survey (Appendix A) was completed and analyzed, a Caucasian, female sibling dyad from Lee's Summit, Missouri was selected for this study. At the

time of the study, the sisters were 3 and 9 years old. Sessions were conducted in private sessions at a local library.

## **Materials**

Materials for this study consisted of storybooks, video equipment, and games/activities. Other materials included a visual schedule (Appendix B) and visual supports (Appendix C) with information about the target ISBR strategies. The visual schedule was used to provide structure for the younger sibling. During intervention sessions, the researcher used visual supports, which listed each dialogic reading strategy with a visual reminder, to teach the target ISBR strategies. The older sibling later used and referenced the visual supports while reading to the younger sibling. Visual supports were only used during the intervention phase and not used during pre/post-intervention sessions. A total of ten picture books were selected for this study. Table 1 lists the book titles, authors, and age group. Books were selected using the Hargrave and Senechal's (2000) criteria for child-appropriate books:

- Not many words on the page
- Colorful illustrations
- Unknown vocabulary words in text
- Not extremely long or heavily reliant on telling the story
- Narrative genre
- Developmentally appropriate

## **Procedures**

This study consisted of three phases: pre-intervention, intervention, and post-intervention. Two sessions were planned for both the pre- and post-intervention phases, each lasting 30 minutes to an hour. However, during the first pre-intervention session, the younger sibling was inattentive to the books and interactions with her older sibling. This session was disregarded and considered an introductory session to get to know each other. The next two

sessions served as the two pre-intervention sessions. During each pre/post-intervention sessions, the siblings selected two books from a pre-selected collection (Table 1) and read them together. Each book was counted as separate shared story book readings. Therefore 2 shared story book readings took place at each pre/post-intervention session, totaling 4 shared story book reading sessions for pre-intervention and the same for post-intervention.

**Table 1: Book Information**

Title	Author	Age Group	# of pages	Session Used
Papillion Goes to the Vet	A.N. Kang	3-6	40	Pretest 1
No Sleep for Sheep	Karen Beaumont	4-7	32	Pretest 1
Shine!	Patrick McDonnell	5-6	40	Pretest 2
Elliot Gets Lost	David Lowery and Toby Halbrooks	5-6	48	Pretest 2
Little Quack's New Friend	Lauren Thompson	2-6	34	Posttest 1
The Fintastic Fishsitter	Mo O'Hara	3-6	40	Posttest 1
Pig the Pug	Aaron Blabley	3-5	32	Posttest 2
Little Elliot Big Fun	Mike Curato	4-8	40	Posttest 2
PigBoy	Gerald McDermott	4-7	32	Intervention
Bear Feels Sick	Karma Wilson	3-8	40	Intervention

During the pre- and post-intervention sessions, the primary investigator video-recorded the sibling interaction so that frequencies of the following dialogic reading strategies (Justice and Ezell, 2000) could be obtained:

- older sibling's verbal prompts for the younger sibling to talk
- verbal references to print/pictures
- nonverbal references to print/pictures

Verbal prompts encouraged the younger sibling to talk about the story events and make predictions. These prompts included: "Tell me about this picture" and "What do you think will happen next?" Verbal references to print/pictures included labeling (e.g. This is a duck), describing (e.g., The duck is yellow. That is a big duck.) and commenting on the story and pictures (e.g., That event made the duck sad/There are a lot of ducks on the page. Let's count them). Nonverbal references to print/pictures included tracking print with their fingers and pointing to print and pictures in the book.

During the introductory session, the children's parent read and signed the informed consent paperwork and the participants provided verbal assent to participate. The sibling's father attended this session and sat outside of the library study room. The siblings were close and comfortable with each other and quickly established rapport with the researcher. As mentioned previously, this was intended to be the first pre-intervention session but the younger sibling did not attend to the book reading and asked to leave the session to talk to her dad or go to the bathroom. This session did not have a set schedule or many activities to sustain her attention. Due to the younger sibling's inattention, the main researcher did not include this session as one

of the pre-intervention sessions. The next two sessions were used as the pre-intervention sessions.

After the younger sibling's inattention during the introductory session, the researcher brought activities (coloring, Play-doh, art kits, and letter games) and a visual schedule (Appendix B) to all of the subsequent sessions. The visual schedule (Appendix B) listed all activities for the session to provide the younger sibling with structure and expectations about reading and free time. Visual schedules for pre/post-intervention sessions listed two separate book interactions while intervention sessions listed one. While using the visual schedule, the researcher instructed the sibling to listen when her sister is reading, that talking to her dad and going to the bathroom is for free time, and that she could earn fruit snacks at the end of the session. After each task (activities, shared story book readings, and instructions) was completed, the siblings took turns marking off that task on the visual schedule. During pre/post-intervention sessions, the activities were used in-between shared story book readings, but during intervention sessions the sessions started with an activity. The researcher also introduced activities during intervention shared story book readings based on the younger sibling's attention/behavior. When the younger sibling sat and attended to the book reading, the researcher did not use activities. At the end of each session, both siblings received fruit snacks as a reward.

The intervention phase consisted of three stages: *the modeling stage*, the *direct teaching stage*, and the *indirect teaching stage*. The researcher selected this design to provide adequate training to the older sibling before promoting independence by fading the researcher's support. These phases occurred over 8 sessions or 2 sessions per week for 4 weeks. The siblings read one book per session and repeated that book for a total of 4 sessions. This resulted in only 2 books and 4 exposures per book during the 8 intervention sessions (e.g., Week 1 & 2 has 1 book over 4



sessions). Researchers based this design on Justice et al.'s (2005) study where at-risk children benefited from 4 elaborated (reading with strategies) exposures to the same book. The researcher solely selected these books using the Hargrave and Senechal's (2000) criteria for child-appropriate books (see criteria listed above).

The *modeling stage* consisted of one week (sessions 3 and 4), where the main researcher read the book to the older sibling and the younger sibling, while explaining the strategies to older sibling. Prior to each reading, the researcher and older sibling reviewed strategies and provided an example for each strategy while referencing the visual supports (Appendix C). The researcher explicitly described the use of strategies during the book reading (e.g., "I am trying to get your sister's attention, so I am going to use a prompt.") The researcher pointed to "prompt" on visual support and stated, "This will help her engage and tell me about the story." Then, the researcher turned to younger sibling and said, "Tell me about this picture" or "What do you think will happen next?". Additionally, the researcher asked the older sibling to identify the strategies used throughout the reading to ensure the older sibling understood and could name each strategy. After the reading, the older sibling and the researcher discussed each strategy while referencing the visual support, and identified examples of each strategy. Furthermore, the researcher described the behaviors of the younger and older sibling during the readings. The siblings were then dismissed with fruit snacks.

The *direct teaching stage* occurred over 2 weeks (sessions 5-8). During this stage, the older sibling read while the researcher verbally identified the older sibling's use of the strategies, modeled strategies if needed, and provided examples of ways to use the strategies. The older sibling read the book from the previous week for sessions 5 and 6, and began a new book for sessions 7 and 8. During this stage, the researcher positioned the supports near the older sibling,

and encouraged the older sibling to reference the visual supports, and to remember to use the strategies. If the older sibling read 2 pages word-for-word without any target strategies, the researcher stopped her and asked how she could use one of the strategies on these pages. If the older sibling could not identify a strategy to use, the researcher would select a strategy, explain why it was selected, and model the use of that strategy (e.g., “The pig is caged up. Something big is probably going to happen next. Prompting would be a good strategy to use because it allows your sister to tell you what is going on or what she things might happen. Remember, you are using these strategies to help your sister be a part of reading the story.”). In this stage, the older sibling experienced independence during reading but also received immediate feedback when she used or did not use the target strategies. Following the reading, the researcher gave feedback and described the behaviors of the younger and older sibling during the readings. At the end of the session, the older sibling verbalized understanding of that day’s session and was then dismissed. Both sibling received a fruit snack.

The intervention phase concluded with the *indirect teaching* stage, which occurred over sessions 9 and 10. During this stage, the older sibling independently read the book from the previous week. During these book readings, the visual supports remained next to the older sibling for easy access and reference. The researcher did not provide comments or feedback until after the shared story book reading. This allowed the older sibling to have independence but still allowed the researcher opportunity to mold the sibling’s use of target teaching strategies. An example of feedback was the researcher saying, “Good job. You used a lot of strategies but you skipped several pages without using strategies. Did you notice times where your sister was not paying attention? Those were times where you were not including her in the story. Try to use more strategies while you are reading. This helps your sister to keep her attention on what you’re

reading”. If the older sibling read the book but used few target strategies, then the researcher revisited the book and found pictures that were suitable for using specific strategies. After this discussion, the older sibling verbalized understanding of the day’s session and both siblings were dismissed with fruit snacks.

After the 8 intervention sessions, the post-intervention phase (sessions 11 and 12) assessed the older sibling’s independent implementation of dialogic reading strategies during shared story book reading with her younger sibling. These last 2 sessions (4 shared story book readings with 4 different books) followed the same procedures as the pre-intervention sessions.

## Results

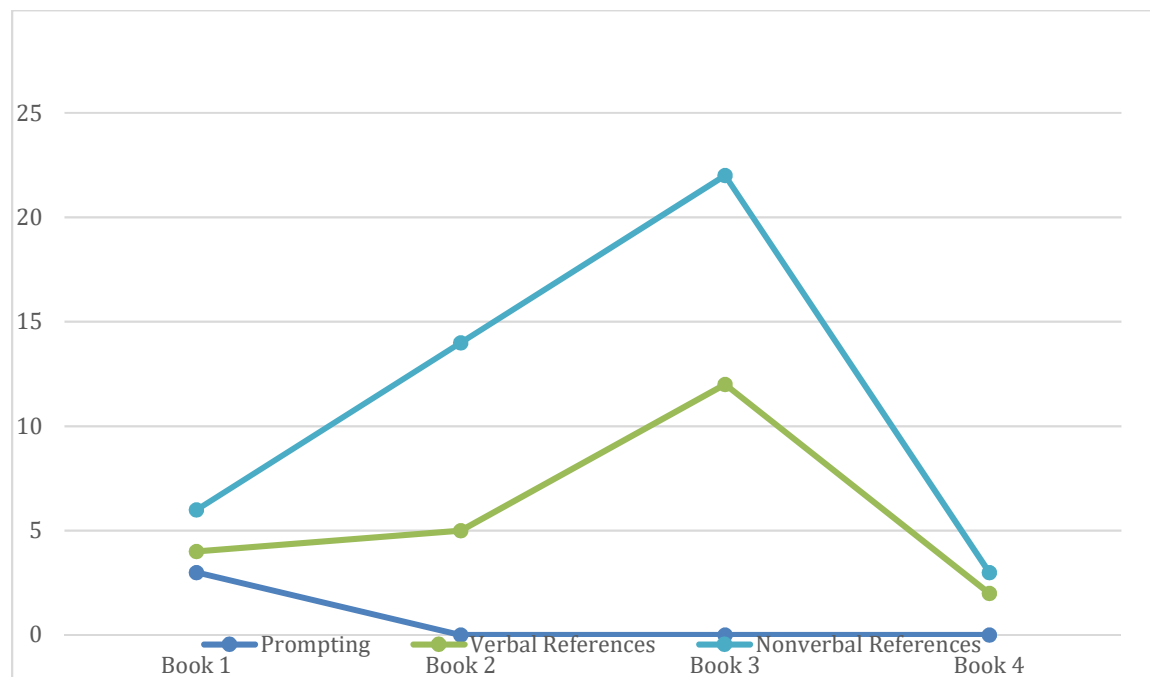
This study investigated whether an older sibling could implement dialogic reading strategies during a shared book reading. To assess this question, the researcher recorded and analyzed the older sibling's use of target dialogic reading strategies by comparing the frequency of strategies before and after intervention. As illustrated below in Table 2 and Figure 1, the older sibling used a total of 0 target strategies during the 4 pre-intervention sessions and a total of 45 target strategies in 4 post-intervention sessions. These results suggest that an older sibling can implement dialogic strategies during shared book reading following a short-term training program.

**Table 2: Differences in Strategy Use by Older Sibling**

		Pretest 1		Pretest 2		TOTAL	Posttest 1		Posttest 2		TOTAL
		B 1	B 2	B 3	B 4		B 1	B 2	B 3	B 4	
Prompting	What do you think will happen?	0	0	0	0	0	2	0	0	0	2
	Tell me about this picture	0	0	0	0	0	1	0	0	0	1
Verbal References	Labeling	0	0	0	0	0	0	3	0	0	3
	Describing	0	0	0	0	0	0	1	5	0	6
	Commenting	0	0	0	0	0	1	1	7	2	11
Nonverbal References	Pointing	0	0	0	0	0	2	9	9	1	21
	Tracking Text	0	0	0	0	0	0	0	1	0	1
TOTAL		0		0		0	6	14	22	3	45

**Note: B = book**

**Figure 1: Frequency of Strategies During Post-intervention**



The older sibling's frequency of each strategy increased across sessions. The older sibling used a total of 0 prompting strategies during the pre-intervention sessions and a total of 3 prompting strategies during the post-intervention sessions. Likewise, the older sibling used a total of 0 verbal references in pre-intervention sessions and a total of 20 verbal references in post-intervention sessions. Finally, the older sibling used a total of 0 nonverbal references in pre-intervention sessions and a total of 21 verbal references during post-intervention sessions. As seen in Table 2 and Figure 1, the older sibling increased usage of each verbal and nonverbal references excluding the last session, where the older sibling used each strategy less than 5 times. Furthermore, she used commenting (verbal) and pointing (nonverbal) more frequently than other sub strategies.

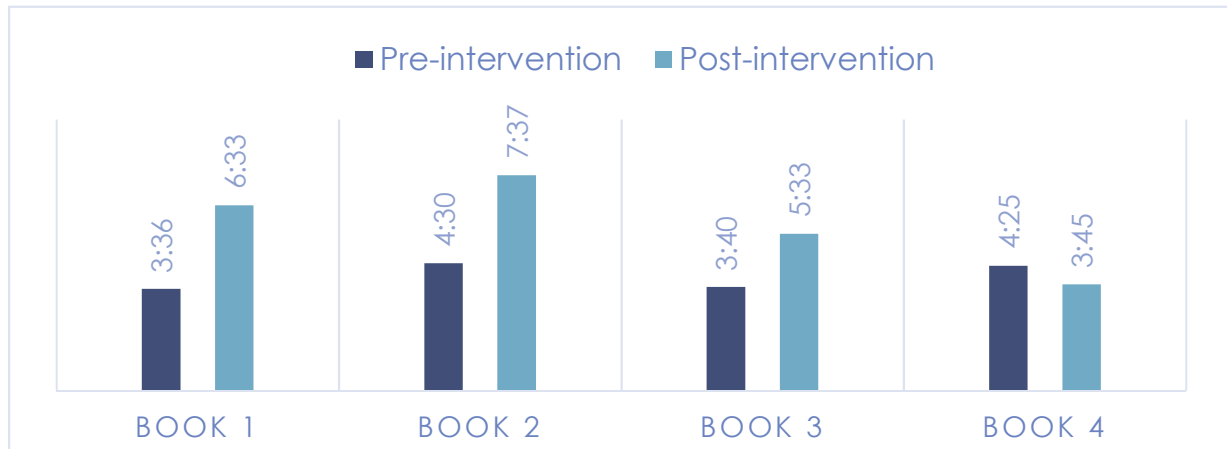
Researchers used an additional analysis to determine the difference in interaction between pre- and post-introduction. As illustrated in Table 3 and Figure 2 below, book

interactions in post- intervention sessions were consistently longer than pre-intervention sessions, meaning participant engagement increased. Additionally, post-intervention reading times increased despite post-intervention books containing less pages than pre-intervention books. However, as demonstrated in strategy use, reading duration was lower in the last post-intervention session than the last pre-intervention session.

**Table 3: Pre-Intervention and Post-Intervention Book Information**

<b>Pre-Intervention Book 1</b>	<b>3-6</b>	<b>Post-Intervention Book 1</b>	<b>3-6</b>
<b>Papillion Goes to the Vet</b>	<b>40 pgs.</b>	<b>Little Quack's New Friend</b>	<b>34 pgs.</b>
<b>Pre-Intervention Book 2</b>	<b>4-7</b>	<b>Post-Intervention Book 2</b>	<b>3-6</b>
<b>No Sleep for Sheep</b>	<b>42 pgs.</b>	<b>The Fintastic Fishsister</b>	<b>40 pgs.</b>
<b>Pre- Intervention Book 3</b>	<b>5-6</b>	<b>Post- Intervention Book 3</b>	<b>3-5</b>
<b>Shine!</b>	<b>40 pgs.</b>	<b>Pig the Pug</b>	<b>32 pgs.</b>
<b>Pre- Intervention Book 4</b>	<b>5-6</b>	<b>Post- Intervention Book 4</b>	<b>4-8</b>
<b>Elliot Gets Lost</b>	<b>48 pgs.</b>	<b>Little Elliot Big Fun</b>	<b>40 pgs.</b>

**Figure 2: Difference in Reading Times from Pre- and Post- Intervention Sessions**



This study also investigated the benefits and challenges of an older sibling implementing interactive shared book reading with a younger sibling. Researchers assessed this measure by analyzing the behaviors of the siblings during book reading. During pre- and post- intervention sessions, the researcher observed excitement and discussion about the book when both siblings were engaged. Additionally, the researcher observed the older sibling commenting and describing the book to herself then sharing her thoughts and comments with her sister. This is consistent with research on synergy in sibling interactions, where children teach their siblings a skill while expanding upon that skill themselves (Gregory, 2001). The researcher also experienced challenging moments to maintain the younger sibling's attention. The younger sibling struggled to sit through readings and required activities and incentives during book readings. Furthermore, the researcher sometimes had to redirect the younger sibling to the book to maintain the younger sibling's attention throughout the reading.

### **Observations of pre-intervention phase**

During the pre-intervention sessions, the older sibling read each of the four books and did not use any of the target dialogic reading strategies. During these sessions, the older sibling read

the book aloud but did not stop to talk about the book. The older sibling did not show or engage her sister in the reading. Little interaction was observed between the two siblings during the pre-intervention sessions. During the first pre-intervention session, which was disregarded, the younger sibling refused to sit down during the reading. She walked around the room to look at the camera, observe the objects in the room, go to the restroom, and visit with her dad several times who sat outside the study room. When introduced to crafts, videos, and a visual schedule in the following sessions, the younger sibling attended and sat while older sibling read.

### **Observations of post- intervention phase**

During the post-intervention, the older sibling read 4 books over two sessions without comments from the researcher or visual supports. As mentioned above, the older sibling demonstrated a significant difference in use of strategies with 0 strategies in pre-intervention sessions and 45 strategies in post-intervention sessions. Additionally, the frequency of different types of strategies used over the course of the post-intervention is also interesting.



## **Discussion**

This study was designed to investigate an older sibling's ability to implement dialogic reading strategies during shared reading, and the advantages and disadvantages of sibling-implemented book reading interactions. In the beginning of the study, researchers hypothesized that the older sibling would increase their use of dialogic reading strategies during shared book reading.

### **Question 1: Implementation of Reading Strategies by Older Sibling**

The results of this study supported this hypothesis indicating that older siblings are capable of learning and implementing dialogic reading strategies following a short intervention period. The older sibling's use of dialogic reading strategies increased from a total of 0 across 4 pre-intervention sessions to a total of 45 across 4 post-intervention sessions. Commenting and pointing were the main strategies used with 11 and 21 uses respectively. The results from the present study are consistent with adult and parent training programs where adults increased in the usage of dialogic reading strategies during shared book reading with their children (Blom-Hoffman et al., 2007; Justice & Ezell, 2000).

In pre-intervention sessions, the older sibling did not engage or actively involve her sister in the reading experience. This interaction may be similar to adults and/or parents who have not experienced or interactive shared book reading strategies because many reading facilitators are unfamiliar with the best ways to implement storybook reading (Bus & van IJzendoorn, 1995; Nino, 1980). As training occurred in the intervention stage, the older sibling demonstrated understanding of the strategies. During post-intervention book readings, the older sibling appeared more aware of the younger sibling's level of interaction. When the younger sibling attended more to crafts during the reading, the older sibling appeared to decrease the number of

strategies used. Additionally, the amount of book engagement increased (Table 3). This could be contributed to increased interaction between participants during the book reading. However, difference in book length (see Table 1) should also be considered.

## **Question 2: Benefits and Challenges of Sibling-Initiated Book Reading Interactions**

There are several benefits and challenges of sibling-initiated shared story book readings. First, siblings most likely have similar schedules and interests in the home, making their interactions with each other more frequent than with their parents. Children of parents with nonstandard schedules may have more interaction with their siblings than their parents (Li et al., 2014; Wight et al., 2008). Additionally, sibling relationships significantly influence children's interests and learning experiences. Specifically, older siblings influence their younger sibling's reading experiences (Knoester & Plikuhn, 2016). For these reasons and with the indications that older siblings can learn dialogic reading strategies, shared story book readings between siblings may be beneficial, especially to low-SES families or families with nonstandard schedules.

The first challenge of the sibling-initiated readings was the younger sibling's attention and participation. The younger sibling in this study was a curious and opinionated; when initially entering the study environment, she explored in and out of the room, despite instructions to sit from her dad, older sister, and the researcher. The younger sibling set her own rules and refused to change her mind about anything if she didn't want to. Throughout the study, the researcher found it difficult to convince the younger sibling to sit still or stay within the study room. This challenge continued to the storybook readings where the younger sibling was up from her chair repeatedly instead of sitting for the duration of the story. During times in the intervention period, the younger sibling left the room several times and once refused to return so the older sibling

read to the researcher for the remainder of the story. The younger sibling's behavior could be attributed to the unfamiliar setting and researcher. This behavior may have been better or worse if the intervention occurred at home or if the researcher was not present during the reading. However, these behaviors may be representative of a sibling-initiated reading interaction. Older siblings do not hold the same authoritative nature as a parent or adult (Abuhatoum & Howe, 2008). This may result in a decreased level of respect for the older sibling, which may be evident in the younger sibling's behavior.

The older sibling in this study was attentive to her sister. During readings, the older sibling frequently stopped reading to validate her sister's comments about the story and other non-related matters (e.g. non-literacy activities, comments about dad, and younger sibling's desire to not participate). During the intervention and post-intervention phase, the older sibling appeared to be influenced by the younger sibling's behavior more than during the pre-intervention phase. During the latter two phases, the older sibling often verified that the younger sibling was listening before reading the book. However, if the younger sibling refused to sit, purposefully ignored the older sibling's comments, or refused to interact in the reading, the older sibling became quiet, slowly looked through the book pictures, and interacted with the book alone. These breaks in interaction were temporary with the exception of the younger sibling exiting the room and refusing to come back. Additionally, these interactions were few, due to non-literacy materials, but occurred during some pre-intervention and intervention sessions. The main researcher was needed to mediate these interactions. This change in the older sibling's response to the younger sibling's behavior is most likely a result of the training. During the intervention phase, the older sibling learned to engage her sister and became conscious of her sister's behavior.

## **Implications for Clinical Practice and Additions to Research**

This study provides several additions to the shared storybook research. The sibling language/literacy research pool is relatively small, with most studies found focusing mainly on sibling relationships throughout the lifespan, sibling interactions during events (e.g. play, reading, etc), and impacts of older siblings on younger sibling's language and literacy. At the time of this investigation, no studies had implemented sibling-training programs with shared storybook reading. Furthermore, no studies had assessed the use of interactive story book reading strategies in siblings. This single-subject study initiates this area of research, and suggests that shared story book reading with sibling pairs is worthy of additional investigation.

## **Limitations and Future Research**

There were several limitations to this study that should be addressed in future research. First, this study was limited to one sibling dyad. A single sibling dyad is far from a representative sample of low SES siblings. Also, a single subject/dyad design does not include a control for comparison. Without a control comparison, the researcher does not know if the change in the older sibling's interaction with her younger sibling was due to the training or some other variable (e.g., maturation, the use of activities during the session, the younger sibling's attention, etc.) Future research should include a more representative sample of sibling dyads, including a variety of demographics (e.g., gender, race/ethnicity, age), and a control group to verify that any change was due to the training or intervention.

Additionally, this study occurred over a 12-session period, and 8 sessions of training. Older siblings may need longer training to consistently implement all of the targeted strategies, and to become more effective users of dialogic reading strategies. Longitudinal studies could

assess the long-term benefits and challenges of a sibling training program such as whether siblings continue to independently use these strategies in home reading interactions, and whether these strategies have positive long-term effects on the younger sibling's language and literacy development.

Methodologically, there were several procedures that limited the study. One limitation was that the researcher did not implement a script into this reading program. A script for the researcher and older sibling during the reading may be beneficial to maintain consistency throughout the training. Additionally, the researcher did not explicitly distinguish the difference between literacy (expanding upon the events of the story) and general comments (comments about print/text). In this study, the older sibling mainly used commenting and pointing in post-intervention sessions. However, many of the comments used did not target literacy aspects (e.g. plot, reflection, vocabulary, etc). In the future, researcher may consider distinguishing target comment further to encourage language and literacy growth in both participants.

Additional limitations to the methods and procedures of this study may question the validity of the study's results. First, recordings were not gathered during the intervention period. This information would have been helpful to further understand the older sibling's implementation of the intervention. Additionally, this data would have been beneficial to explain the younger sibling's interactions during the intervention period and investigate the relationship between the younger sibling's attention and participation, and the number of dialogic reading strategies that the older sibling used. Second, the researcher did not measure the younger sibling's change in language and literacy skills from pre- to post- intervention. This information would have been beneficial in determining whether the sibling-implemented readings increased the younger sibling's language and literacy skills. Future research should target these limitations.

Three more limitations of this study were the strategy used to teach the older sibling, the lack of participant rating scales, and the use of non-literacy materials. In this study, the researcher taught all strategies together, which may have been difficult for the older sibling to learn. In the future, researchers should consider teaching one strategy to mastery before teaching the next strategy. Furthermore, the researchers did not require the participants to complete rating scales before and after the study. Participant rating scales after readings may be helpful to understand personal perspectives about the reading and determine how the older sibling enjoys the role of facilitator. Finally, this study used coloring, play-doh and other non-literacy activities to keep the younger sibling's attention. However, in the future, researchers should consider using a routine activity with the reading, such as drawing out the events of the story or having the younger sibling draw themselves within the story plot. Researchers may choose to use higher literacy activities in book reading to better involve the younger sibling.

Another limitation of this project was study environment and presence of an adult researcher and video recording equipment. In this study, the researcher observed each book reading and closely monitored the older sibling's interaction with the younger sibling during pre- and post-intervention readings. According to this study's rationale, this is unrealistic to interactions that may occur in home environments for low SES families (Han, 2004; Wight, Raley, Bianchi, 2008; Yeung, Linver, & Brooks, 2002). Future research should investigate sibling-initiated interactions without the presence of an adult to fully determine whether these types of interactions can occur in the natural environment. Additionally, it is important to assess these interactions in the home environment. This study occurred in a public library study room, outside of the participants home community. Many aspects of this environment are unfamiliar which may have influenced the younger sibling's attention to the study procedures.

The final limitation was implantation of non-literacy activities (e.g., coloring, Play-doh, art kits, and letter games) during the shared book reading training. Because of the younger sibling's inattention during the sessions, the main researcher introduced activities and crafts to the session. These activities and crafts carried over into the book reading, which complicated the validity of a ISBR. Dialogic reading is considered an *adult-child* interaction where the adult prompts the child to participate in telling a story while providing comments and clear feedback on the story's plot. The adult, who possesses a level of power and authority, initiates the reading and passively monitors the success of this reading from start to finish. The child follows the adults lead and actively participates in the reading, answering prompts and gathering information about the book.

This study consisted of *child-initiated* readings, where the older sibling actively involved the younger sibling through prompts, references, and comments on the book's plot and pictures. However, the older sibling did not possess the same authoritative nature as an adult or parent. Therefore, the younger sibling challenged this reading interaction and struggled to follow the older sibling's lead. Crafts and additional activities were required to distract the younger sibling, thus keeping her attention enough to allow the older sibling to engage her in the book.

In this study, the facilitator, strategies, and additional materials differed from the standard, adult-implemented ISBR studies and complicated how we evaluate the siblings' interactions with the book. One may ask whether the older sibling was able to increase her use of ISBR strategies due to the presence of other, non-literacy activities or if she would have implemented these strategies anyway. Perhaps future research can focus on a developing a sibling-specific training program, similar to that of this study, that considers the differing factors between adults and children (e.g. attention, authority/power struggle, need for structure, and

activities/games) while eliciting the same results (e.g. active book participation and increased interaction facilitator) and possibly improving language and literacy skills.



## **Conclusion**

Children are significantly influenced by their environments and the people around them. Children from low SES backgrounds are further influenced because their environments can result in significant disadvantages, especially limitations on their language and literacy experiences. Educators, parents, and even siblings play a vital role in these children's home language and literacy environments and can be a factor that changes the trajectory of a child's academic achievement. Education and training programs for these facilitators is crucial to bridging the income, health, and academic achievement gaps present in today's society. Shared storybook reading is one potential way to reduce these gaps. Shared story book reading increases growth in language and literacy skills which later increases academic achievement and success in typically developing children and children with language/literacy deficits. This reading interaction can be easily implemented by adults, teachers, and possibly siblings as research advances. With continued research in this area, language and literacy environments in the homes of low SES families may one day match those of mid- and high-SES families and reduce existing educational disparities.

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## Appendix A Entry Questionnaire

### Participant Entry Questionnaire

The following questions will be used to describe participants in the study and to determine eligibility. Please answer and return the primary researcher.

Names of Participants:

1) \_\_\_\_\_ 2) \_\_\_\_\_

Ages: 1) \_\_\_\_\_ 2) \_\_\_\_\_ Gender: 1) \_\_\_\_\_ 2) \_\_\_\_\_

Race/Ethnicity: \_\_\_\_\_

Parent/Guardian Names: \_\_\_\_\_

Social Security Number: (payment purposes) \_\_\_\_\_

Languages spoken: \_\_\_\_\_

yes	no	1.	Do your children receive free/reduced lunch at school?
yes	no	2.	Are your children English only speakers?
yes	no	3.	Does the oldest child participating in the study receive speech/language services?
yes	no	4.	Is the oldest child participating in the study read at his/her grade-level?
yes	no	5.	Do your children read together at home?
yes	no	6.	Do your children enjoy reading or being read to?
yes	no	7.	Are your children able to attend to an activity for 20 minutes to 30 minutes?

Please list games that your children enjoy.

Please list the interests of your children.

Appendix B  
Visual Schedule

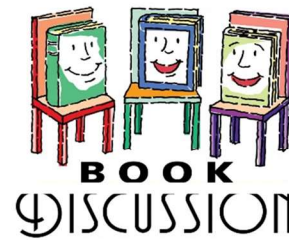
Our Visual Schedule

☐ Talk about what we're doing today

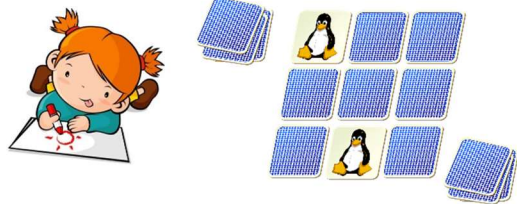
☐ Play Go Fish



☐ Talk about reading strategies



☐ Play matching game/draw



☐ Read the book



☐ Snack!!



# Prompts



# Nonverbal References



# Verbal References





# **Prompts**

**“Tell me about this  
picture”**

**“What do you think  
will happen next?”**

# **Nonverbal** **References**



**Pointing to  
pictures/print**

**Tracing words on the  
page**

# **Verbal** **References**



**Labeling Pictures**

**Describing Pictures**

**Commenting on  
pictures**